

**Student:** \_\_\_\_\_  
**Date:** \_\_\_\_\_  
**Time:** \_\_\_\_\_

**Instructor:** Nader Green  
**Course:** Algebra Spring 2016  
(Mon-Wed)  
**Book:** Lial: Introductory Algebra, 10e

**Assignment:** Pre-Test for Ch3. Eq,  
Ineq, and App

1. Solve the equation and check your solution.

$$-\frac{1}{9}(x-27) + \frac{1}{3}(x+3) = x-17$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution set is  $\{\square\}$ . (Simplify your answer.)  
☐ B. The solution is all real numbers.  
☐ C. The solution is the empty set.

2. Solve the equation and check your solution.

$$0.45(6) + 0.05x = 0.15(6+x)$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution set is  $\{\square\}$ . (Simplify your answer.)  
☐ B. The solution is all real numbers.  
☐ C. The solution is the empty set.

3. Mary is  $n$  years old. How old will she be in 4 years? How old was she 2 years ago?

In 4 years, Mary will be  years old.

Two years ago, Mary was  years old.

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4. Solve the following problem. Give the equation using  $x$  as the variable, and give the answer.

The sum of four times a number and 7 more than the number is the same as the difference between  $-17$  and three times the number. What is the number?

Write the equation using  $x$  as the variable. Choose the correct equation below.

- ☐ A.  $4x - 7x = -17 - 3x$   
☐ B.  $4x + (x + 7) = 3x - (-17)$   
☐ C.  $4x + (x + 7) = -17 - 3x$   
☐ D.  $4x - 7x = 3x - (-17)$

The number is .

5. A minor league baseball team plays 93 games in a season. If the team won 17 more than three times as many games as they lost, how many wins and losses did the team have?

How many games did the team lose?

How many games did they win?

6. The sum of the page numbers on the facing pages of a book is 81. What are the page numbers?

The number on the left page is  and the number on the right page is .

7. Find two consecutive even integers such that the smaller added to two times the larger gives a sum of 16.

The numbers are .

(Use a comma to separate answers.)

8. Find the measure of an angle whose supplement measures nine times its measure.

The angle measures  degrees.

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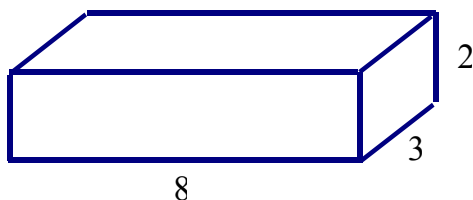
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9. Decide whether perimeter or area would be used to find the quantity of flower seeds needed for a field.

Choose the correct type of measurement.

- ☐ area  
☐ perimeter

10.



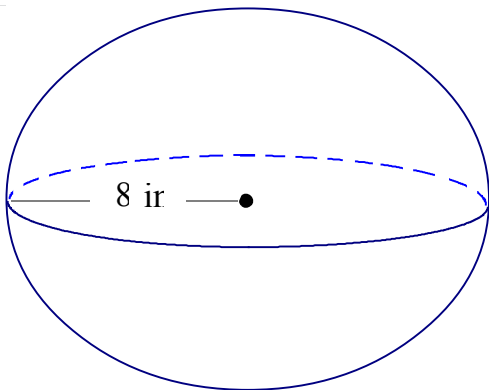
Evaluate V.

$$V = LWH$$

$$L = 8, W = 3, H = 2$$

The answer is .

11.



(Volume of a sphere)

$$V = \frac{4}{3}\pi r^3$$

Find the value of V given that  $r = 8$ .  
Use 3.14 for  $\pi$ .

$$V = \text{$$

(Round to the nearest hundredth.)

12.

A flower bed is in the shape of a triangle with one side twice the length of the shortest side, and the third side is 18 feet more than the length of the shortest side. Find the dimensions if the perimeter is 150 feet.

$$a = \text{ ft} \quad (\text{shortest side})$$

$$b = \text{ ft} \quad (\text{second side})$$

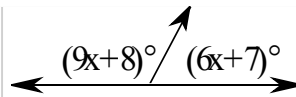
$$c = \text{ ft} \quad (\text{third side})$$

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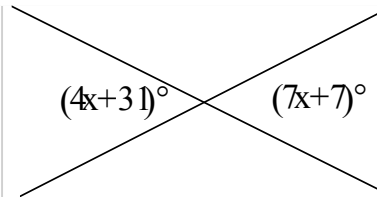
13. Find the measure of each marked angle.



The larger angle measures °.

The smaller angle measures °.

14. Find the measure of the marked angles.



The measure of the angles is  degrees.

15. Solve the equation for the specified variable.

$$U = F(b + R), \text{ for } b$$

$$b = \text{$$

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16. Match each ratio in column I with the ratio equivalent to it in column II.

<b>I</b>	<b>II</b>
(a) 30 to 45	A. 100 to 60
(b) 3 to 5	B. 60 to 120
(c) $\frac{1}{2}$	C. 2 to 3
(d) 5 to 3	D. 9 to 15

Choose the correct answers below.

(a) 30 to 45

A. 100 to 60  
B. 60 to 120  
C. 2 to 3  
D. 9 to 15

(b) 3 to 5

A. 100 to 60  
B. 60 to 120  
C. 2 to 3  
D. 9 to 15

(c)  $\frac{1}{2}$

A. 100 to 60  
B. 60 to 120  
C. 2 to 3  
D. 9 to 15

(d) 5 to 3

A. 100 to 60  
B. 60 to 120  
C. 2 to 3  
D. 9 to 15

17. Write a ratio for the following word phrase. Write the fraction in lowest terms.

4 yd to 60 in.

The ratio is .

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18. Find the best buy (based on price per unit) for the item.  
Give the unit price to the nearest thousandth for that size.

Vegetable oil	
Size	Price
16 oz	\$1.68
32 oz	\$2.58
64 oz	\$3.89
128 oz	\$8.02

Choose the correct size with the lowest unit price below.

- ☐ A. 64 oz  
☐ B. 32 oz  
☐ C. 16 oz  
☐ D. 128 oz

The unit price to the nearest thousandth for the best buy size is \$ .

19. Solve.

$$\frac{5r + 30}{15} = \frac{5r - 20}{5}$$

The solution set is  $\{\square\}$ .  
(Simplify your answer.)

20. If 2 sweaters cost \$26.58, how much would 7 sweaters cost?

The cost is \$ .

(Type an integer or a decimal.)

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21. There were 9 licensed drivers for every 10 registered vehicles. If there were 34.1 million registered vehicles, how many licensed drivers were there?

Note that the number of licensed drivers per 34.1 million registered vehicles is unknown. To solve this problem, first set up a proportion by equating the ratios of drivers to vehicles.

Thus, set the proportion with 



 in the numerator and 



 in the denominator.

To set up a proportion, use  $x$  as the variable to denote the number of licensed drivers in millions.

$$\begin{array}{l} \text{Drivers} \rightarrow 9 \\ \text{Vehicles} \rightarrow 10 \end{array} = \frac{\quad}{\quad}$$

(Use integers or decimals for any numbers in the expression.)

Solve the proportion for  $x$  by using the cross product. Find the cross product.

If  $\frac{9}{10} = \frac{x}{34.1}$ , then

$9 \cdot 34.1 = 10 \cdot x.$
$9 \cdot 10 = 34.1 \cdot x.$
$34.1 \cdot 10 = 9x.$

Solve the resulting equation for  $x$ .

$$9 \cdot 34.1 = 10x$$

$$\boxed{\quad} = 10x$$

Multiply.

Divide each side by 10.

$$306.9 = 10x$$

$$\boxed{\quad} = x$$

(Type an integer or a decimal.)

To check the answer, substitute the value of  $x$  in the original proportion and see if each ratio is the same.

$$\frac{9}{10} = \frac{x}{34.1}$$

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21.  $\frac{9}{10} = \frac{?}{34.1} \cdot \frac{100}{100}$   
(cont.)

Substitute 30.69 for x.

$$\frac{9}{10} = \frac{?}{3410}$$

Write each number in the proportion as an integer.

$$\frac{9}{10} = \boxed{\phantom{00}}$$

Write a fraction in lowest terms.

(Type an integer or a simplified fraction.)

The check confirms that the solution is 30.69. Therefore, the number of licensed drivers per 34.1 million registered vehicles is 30.69 million.



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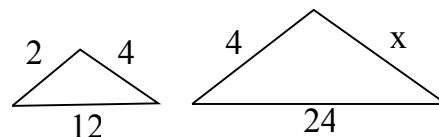
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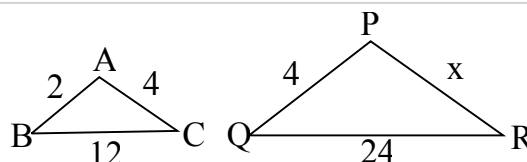
22.

Two triangles are similar if they have the same shape (but not necessarily the same size). Similar triangles have sides that are proportional.

Find the length x for the given pair of similar triangles.



For the sake of convenience, name both triangles as shown in the figure.



Begin by identifying the corresponding sides of the similar triangles.

Side AB corresponds to PR,  
QR,  
PQ, BC corresponds to PR,  
QR,  
PQ, and AC corresponds to PQ.  
PR.  
QR.

To find the value of x, set up a proportion using the fact that the ratios of the corresponding sides are equal. Choose the correct answer below.

☐ A.  $\frac{AC}{PR} = \frac{BC}{QR}$

☐ B.  $\frac{PR}{AC} = \frac{AB}{PQ}$

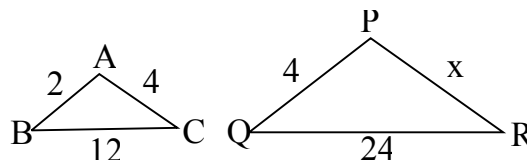
☐ C.  $\frac{AC}{PR} = \frac{QR}{BC}$

☐ D.  $\frac{AB}{PQ} = \frac{BC}{QR}$

Substitute the corresponding values for BC and QR.

$$\frac{AC}{PR} = \frac{BC}{QR}$$

$$\frac{4}{x} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$



Solve the proportion for x by using the cross product.

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22.  
(cont.)

If  $\frac{4}{x} = \frac{12}{24}$ , then

$$\begin{aligned} 4 \cdot 24 &= 12 \cdot x. \\ 12 \cdot 24 &= 4 \cdot x. \\ 4 \cdot 12 &= 24 \cdot x. \end{aligned}$$

Solve the resulting equation for x.

$$4 \cdot 24 = 12 \cdot x$$

$$\boxed{\phantom{00}} = 12x$$

Multiply.

Divide each side by 12.

$$96 = 12x$$

$$\boxed{\phantom{00}} = x$$

(Type an integer or a decimal.)

Check by substituting 8 for x in the proportion to see that the corresponding ratios are equal.

$$\frac{AC}{PR} = \frac{BC}{QR}$$

$$\frac{4}{8} = \frac{12}{24}$$

$$\frac{1}{2} = \boxed{\phantom{00}}$$

Simplify.

The check confirms that the solution is 8. Therefore, the length of the unknown side is 8.

23.

Tom makes \$326.10 in 6 days. How much does he make in 3 days?

Tom makes \$  $\boxed{\phantom{00}}$  in 3 days.

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24. There were 9 licensed drivers for every 10 registered vehicles. If there were 33.3 million registered vehicles, how many licensed drivers were there?

Note that the number of licensed drivers per 33.3 million registered vehicles is unknown. To solve this problem, first set up a proportion by equating the ratios of drivers to vehicles.

Thus, set the proportion with 

drivers
vehicles

 in the numerator and 

drivers
vehicles

 in the denominator.

To set up a proportion, use  $x$  as the variable to denote the number of licensed drivers in millions.

$$\begin{array}{l} \text{Drivers} \rightarrow 9 \\ \text{Vehicles} \rightarrow 10 \end{array} = \frac{\quad}{\quad}$$

(Use integers or decimals for any numbers in the expression.)

Solve the proportion for  $x$  by using the cross product. Find the cross product.

If  $\frac{9}{10} = \frac{x}{33.3}$ , then

$9 \cdot 33.3 = 10 \cdot x.$
$9 \cdot 10 = 33.3 \cdot x.$
$33.3 \cdot 10 = 9x.$

Solve the resulting equation for  $x$ .

$$9 \cdot 33.3 = 10x$$

$$\boxed{\quad} = 10x$$

Multiply.

Divide each side by 10.

$$299.7 = 10x$$

$$\boxed{\quad} = x$$

(Type an integer or a decimal.)

To check the answer, substitute the value of  $x$  in the original proportion and see if each ratio is the same.

$$\frac{9}{10} = \frac{x}{33.3}$$

$$9 \cdot 33.3 = 10 \cdot 299.7$$

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24.  $\frac{9}{10} = \frac{?}{33.3} \cdot \frac{100}{100}$   
(cont.)

Substitute 29.97 for x.

$$\frac{9}{10} = \frac{?}{3330}$$

Write each number in the proportion as an integer.

$$\frac{9}{10} = \boxed{\phantom{00}}$$

Write a fraction in lowest terms.

(Type an integer or a simplified fraction.)

The check confirms that the solution is 29.97. Therefore, the number of licensed drivers per 33.3 million registered vehicles is 29.97 million.

25. How high is a tree that casts a 25-ft shadow at the same time a 5-ft pole casts a shadow which is 13-ft long?

The tree's height is  $\boxed{\phantom{00}}$  ft.

(Round to the nearest tenth, if necessary.)

26. Translate to an equation and solve.

What is 75% of 274?

$\boxed{\phantom{00}}$  is 75% of 274.

(Simplify your answer. Type an integer or a decimal.)

27. Solve the following problem.

175% of what number is 63?

175% of  $\boxed{\phantom{00}}$  is 63.

(Type an integer or a decimal.)

28. What percent of 75 is 90?

$\boxed{\phantom{00}}$  percent of 75 is 90.

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1. A, 27

2. A, 18

3.  $n + 4$   
 $n - 2$

4. C  
- 3

5. 19  
74

6. 40  
41

7. 4,6

8. 18

9. are:

10. 48

11. 2143.57

12. 33  
66  
51

13. 107  
73

14. 63

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15. 
$$\frac{U - FR}{F}$$

16. **C.** 2 to 3  
**D.** 9 to 15  
**B.** 60 to 120  
**A.** 100 to 60

17. 
$$\frac{12}{5}$$

18. **A**  
0.061

19. 9

20. 93.03

21. drivers  
vehicles  
$$\frac{x}{34.1}$$
$$9 \cdot 34.1 = 10 \cdot x.$$
$$306.9$$
$$30.69$$
$$\frac{9}{10}$$

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22.      PQ,  
          QR,  
          PR.  
          A  
          12  
          24  
           $4 \cdot 24 = 12 \cdot x$ .  
          96  
          8  
           $\frac{1}{2}$

23.      163.05

24.      drivers  
          vehicles  
           $x$   
           $\frac{x}{33.3}$   
           $9 \cdot 33.3 = 10 \cdot x$ .  
          299.7  
          29.97  
           $\frac{9}{10}$

25.      9.6

26.      205.5

27.      36

28.      120